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TITLE: A Framework for Successful Research Experiences in the Classroom: Combining the Power of Technology and Mentors

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AUTHORS (FIRST NAME, LAST NAME): Paige Valderrama Graff¹, William L Stefanov¹, Kim Willis¹, Susan Runco², Tim McCollum³, Charles F Lindgren⁴, Marshalyn Baker⁵, Michele Mailhot⁶ **INSTITUTIONS (ALL):**

1. NASA JSC/ESCG, Houston, TX, United States.

2. NASA JSC, Houston, TX, United States.

3. Charleston MS, Charleston, IL, United States.

4. Scituate HS, Scituate, MA, United States.

5. Messalonskee MS, Messalonskee, ME, United States.

6. ME Dept. of Ed., Oakland, ME, United States.

Title of Team:

ABSTRACT BODY: Authentic research opportunities in the classroom are most impactful when they are student-driven and inquiry-based. These experiences are even more powerful when they involve technology and meaningful connections with scientists. In today's classrooms, activities are driven by state required skills, education standards, and state mandated testing. Therefore, programs that incorporate authentic research must address the needs of teachers. NASA's Expedition Earth and Beyond (EEAB) Program has developed a framework that addresses teacher needs and incorporates the use of technology and access to mentors to promote and enhance authentic research in the classroom.

EEAB is a student involvement program that facilitates student investigations of Earth or planetary comparisons using NASA data. To promote student-led research, EEAB provides standards-aligned, inquiry-based curricular resources, an implementation structure to facilitate research, educator professional development, and ongoing support. This framework also provides teachers with the option to incorporate the use of technology and connect students with a mentor, both of which can enrich student research experiences. The framework is structured by a modeled 9-step process of science which helps students organize their research. With more schools gaining increased access to technology, EEAB has created an option to help schools take advantage of students' interest and comfort with technology by leveraging the use of available technologies to enhance student research. The use of technology not only allows students to collaborate and share their research, it also provides a mechanism for them to work with a mentor. This framework was tested during the 2010/2011 school year. Team workspaces hosted on Wikispaces for Educators allow students to initiate their research and refine their research question initially without external input. This allows teams to work independently and rely on the skills and interests of team members. Once teams finalize their research question, they are assigned a mentor. The mentor introduces himself/herself, acknowledges the initial work the team has conducted, and asks a focused question to help open the lines of communication. Students continue to communicate with their mentor throughout their research. As research is completed, teams can share their investigation during a virtual presentation. These live presentations allow students to share their research with their mentor, other scientists, other students, parents, and school administrators.

After the initial year of testing this authentic research process, EEAB is working to address the many lessons learned. This will allow the program to refine and improve the overall process in an effort to maximize the benefits. Combined, these powerful strategies provide a successful framework to help teachers enhance the skills and motivation of their students, preparing them to become the next generation of scientists, explorers, and STEM-literate citizens of our nation.